The Impact of Enterprise Social Media on Task Performance in Dispersed Teams

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Abstract

This study examines the impact of enterprise social media on the workplace. Drawing on the theory of virtuality and the structure-content framework of social networks, we develop a multi-level research model focused on the extent to which individuals’ network structures and the content enabled by enterprise social media influence individuals’ task performance in dispersed teams. The results of this study reveal that the use of enterprise social media significantly influences the content (expressive or instrumental networks) and structure (intra-team centrality or extra-team structural holes) of individuals’ social networks, which leads to improved task performance. Moreover, the results indicate that the relationship between the use of enterprise social media, network structure and content, and task performance varies depending on the degree of the team’s geographical and temporal dispersion. Based on these findings, this study proposes optimal network strategies to increase individuals’ task performance using enterprise social media within the different contexts of dispersed teams.

1. Introduction

In recent years, enterprise social media (ESM) has been increasingly adopted in organizations to support interpersonal communication, coordination, and collaboration in virtual environments [1, 24]. ESM is comprised of digital platforms incorporating a variety of media tools, such as weblogs, wikis, microblogs, and social networking applications, thereby allowing social interactions, interactive communication, and information sharing among employees within an organization. ESM is usually restricted to the employees of an organization or members with whom they are affiliated or have a business relationship [40]. Along with estimates showing that more than 90% of all Fortune 500 companies have partially or fully implemented an ESM [9], researchers and practitioners are keenly interested in employing ESM [38]. However, the manner in which ESM generates practical values in the workplace is not entirely clear. As Kane et al. [24] noted, ESM provides new social features that have not been extensively incorporated in conventional collaborative technologies, such as USENET, group decision support, or knowledge management systems. Accordingly, researchers are increasingly focusing their attention on theorizing the unique implications of ESM’s novel capabilities in the workplace.

Despite a growing body of literature on the emerging field of ESM [1, 28, 47], there is still a lack of research examining how ESM affects employee’s task performance in the workplace [1]. In particular, few studies have empirically addressed the issues regarding ESM’s effects in the context of dispersed teams (DTs), in which employees are geographically and temporally dispersed. Although one of the greatest potential benefits of ESM is to enhance the ability of employees to develop social networks without face-to-face contact and to reach out to different groups of people strategically through virtual interactions [47], little is known about the transformative value of ESM in terms of individuals’ social networks and their task performance in the context of DTs. Given that dispersed collaborations have become ubiquitous and unavoidable in contemporary organizations, understanding the impact of ESM on individuals’ task performance in DTs will lead to a better understanding of how to design effective and useful social media platforms in organizations that utilize DTs.
Accordingly, this study examines how ESM use influences individuals’ task performance in DTs; this study is guided by the following research question:

*How do individuals’ EMS-enabled social networks influence their task performance in the context of DTs?*

By answering this question, this study provides meaningful implications for both academia and industry. For academia, this study answers the call to study the impact of social technologies in the workplace by creating new knowledge and a richer understanding of the interplay between the use of ESM and its impact on individuals’ social networks and their task performance in the context of DTs. For industry, this study explains the contingent effects of individuals’ social networks on their task performance at varying degrees of geographical and temporal dispersion, thus providing more precise guidance to managers who operate DTs as to how individual DT members can maximize the benefits of adopting ESM within the context of DTs.

2. Theoretical Development

This study builds on two theoretical foundations—the theory of virtuality [39, 42, 43, 44] and the structure-content framework of social networks [24]—to link the use of ESM, social networks, and task performance. These two theoretical perspectives are complementary; the former explains the relationship between the use of digital media and individuals’ social networks, while the latter explains the relationship between EMS-enabled social networks and task performance.

2.1 Theory of Virtuality

The theory of virtuality is a meta theory explaining how individuals develop social relationships in a virtual environment through computer-mediated communication (CMC) media. For several decades, the theory has applied in many contexts, and CMC media has been verified by which it has been verified that CMC media influence to influence both individuals’ task-related [10, 13, 14] and socio-emotional relationships [42, 43, 44]. Building on these studies and using the backdrop of social network theory, Suh et al. [39] developed a model that explains how different types of CMC media determine individuals’ social networks in the workplace. The theory explains that people use diverse media tools in different ways, which therefore leads to different effects on the properties of the individuals’ social networks; for example, those who use personal media that form one-to-one connections are more likely to expand their social networks across work groups, while those who adopt communal media that enforce group interaction are more likely build close social ties within a work group. By applying the theory of virtuality to the context of DTs, we posit that the use of ESM can influence DT members’ intra-team and extra-team social networks.

While the theory of virtuality presents the idea that that an individual’s position in a network and the pattern of connecting ties can be altered by the use of digital media, the theory does not predict the outcomes of these social networks, which limits the understanding of the effects of individuals’ social networks on their performance variance. To fill this gap, we employ the structure-content framework of social networks, which provides key factors that should be considered when examining individuals’ performance variances in a network.

2.2 Structure-Content Framework of Social Networks

The structure-content framework proposed by Kane et al. [24] suggests two explanatory mechanisms underpinning individuals’ performance in a network: structural capital and resource access. Structural capital refers to how a person can obtain a better position within a network; resource access refers to the content that flow within a person’s network.

2.2.1. Structure. Centrality and structural holes are the main structural features of an individual’s network that are associated with his or her task performance [6]. While centrality can be captured by various indexes, this study employs degree centrality because degree centrality has been widely regarded as a key index to predict an individual’s task performance within an organization [37, 48]. Degree centrality refers to the number of direct ties a node in a network holds to other nodes [35]. Structural holes refer to the extent to which a node forms bridges to otherwise unconnected nodes [6, 16].

DT members obtain knowledge not only from those within their team, but also from others across teams. Given that previous studies suggest two parameters— intra-team centrality within a work group (internal cohesion) and external structural holes across work groups (external bridging)—as important predictors of individuals’ task performance [34], this study examines individuals’ network structures by focusing on intra-team centrality and extra-team structural holes.

2.2.2. Content. Depending on the content flowing within a network, the network can be categorized as
either expressive or instrumental [4]. Expressive networks represent emotional relationships that provide friendships and involve the exchange of alliances, trust, and social support [22, 37]. On the other hand, instrumental networks function to exchange work-related resources and typically involve actions that seek information, expertise, and professional advice [19].

An expressive network tie is one in which two persons personally contact and exchange socio-emotional information. ESM stimulates social interactions among employees [47]; this enables employees to establish expressive networks with ease even in the context of DTs, where they have limited opportunities for face-to-face contact. In contrast, an instrumental tie is one in which two persons share work-related information, advice, and guidance. It has been reported that employees utilize ESM for the fast transmission of information and to exchange work-related advice [38]. Accordingly, we infer that the use of ESM allows employees to develop both expressive and instrumental networks, in which people have different positions depending on their networking activities. Although an overlap between expressive and instrumental relationships is natural, people have different types of relations with their colleagues in work groups [14] that serve different functions related to their performance [45]. Therefore, it has been suggested that research should examine these two types of social networks [29, 34].

3. Research Model and Hypotheses

Within the proposed model shown in Figure 1, we argue that the use of ESM influences the structure and content of individuals’ social networks, which, in turn, influence task performance.

The question remaining to be asked is whether the relationship between the use of ESM, social networks, and task performance is constant or it depends on the context of DTs. Previous studies suggested that the degree of team dispersion should be considered when seeking to explain individual dynamics in a DT [32] because team dispersion is the most critical and important feature of a DT [2]. In this vein, we posit that individual dynamics might be shaped by the degree of team dispersion. Team dispersion can be captured by two aspects: the dimensions of the dispersion (geographical and temporal) and the degrees of dispersion in these two dimensions [7].

The relationship between individuals’ use of ESM, social networks, and task performance falls within the realm of individual-level dynamic; in contrast, the contextual factors of DTs are team-level properties. Accordingly, a single-level model necessarily precludes a comprehensive understanding of theoretical influences at different levels; we need to build a multi-level theory that explains one’s task performance in a DT. To do so, we extend the baseline model into the multi-level model by adding the moderating effects of geographical and temporal dispersion of DTs as shown Figure 2. This allows us to simultaneously examine the individual dynamics and the varying contexts of DTs.

3.1 Use of ESM and Social Networks

Physical proximity is not a main determinant of one’s position in a network because electronic connectivity allows people to overcome the physical constraints that are imposed to people to connect ties.
The theory of virtuality argues that the degree of dispersion of a work group does not directly regulate individual members’ networking behaviors; rather, it moderates the effects of digital media on the development of individuals’ social networks within and across their work groups [e.g., 39]. The main premise of the theory is that the effects of digital media on individuals’ network structures are not constant but vary depending on the degrees of geographical and temporal dispersion of a work group. Therefore, we argue that the effects of ESM on one’s social networks should be explained by considering the varying degrees of geographical and temporal dispersion of DTs.

It has been reported that employees who adopt ESM develop better direct and indirect ties because ESM helps reduce or resolve temporal and spatial constraints and facilitates virtual interaction across organizational functional units [48], thereby occupying better positions within and across work groups [47]. Accordingly, it can be inferred that the use of ESM positively influences one’s intra-team centrality and extra-team structural holes. Furthermore, considering the varying degrees of team dispersion, we can also infer that developing better network structures is more salient when team members are highly dispersed geographically and temporally compared to when they are less geographically and temporally dispersed. Therefore, we infer the following two hypotheses:

H1. One’s use of ESM is more positively associated with intra-team centrality when team members are more geographically (H1a) and temporally (H1b) dispersed.

H2. One’s use of ESM is more positively associated with extra-team structural holes when team members are more geographically (H2a) and temporally (H2b) dispersed.

### 3.2 Intra-Team Centrality, Team Dispersion, and Task Performance

Knowledge access and social communication are the main mechanisms underlying individuals’ task performance in the workplace [48]. In terms of knowledge access, it has been acknowledged that an individual who is centrally positioned in a network has better access to timely, relevant, and accurate knowledge because direct ties serve as an important source of access to other group members’ knowledge [17, 41]. With respect to social communication, research suggests that an individual who is centrally positioned in a network is more likely to have collegial social communication with others, building better common ground, maintaining awareness through knowledge exchanges with other members [3], thereby achieving better performance.

When DT members are more geographically and temporally dispersed, individuals experience more difficulty when they need to access knowledge resources and/or address communication misunderstandings [8, 11, 20]. Individuals with a greater number of direct ties with remote team members can save time, cost, and effort when identifying individuals who know certain information [3], responding to interpersonal conflict [25, 31], and enhancing others’ motivation to exchange knowledge [46]. Therefore, we can anticipate that the positive effect of intra-team centrality on task performance will be more salient as the team’s degree of geographical and temporal dispersion increases; that is, individuals are likely to derive more benefits from a central position—which facilitates greater cooperation and more effective resource exchange—within a team with large geographical dispersion than within a team with small geographical dispersion. Therefore, we hypothesize the following:

H3: One’s intra-team centrality is more positively associated with task performance when the team members are more geographically (H3a) and temporally (H3b) dispersed than when they are less geographically and temporally dispersed.

### 3.3 Extra-Team Structural Holes, Team Dispersion, and Task Performance

Another important avenue for achieving better task performance is external ties (i.e., those outside one’s work group). Through interaction with external sources, knowledge workers can gain access information and expertise that is not available within his or her team; this also introduces novel, fresh knowledge to the team, which leads to better task performance [18, 41]. The bridging mechanism of social networks predicts that a large, sparse network with many structural holes (unconnected ties) outside of one’s focal group delivers more benefits than a small, dense network because it allows greater access to timely and diverse external knowledge [34].

However, because individuals have limited amounts of time and energy, they ultimately face a trade-off between internal collaboration—which minimizes the risks caused by geographical and temporal dispersion—and external bridging—which creates opportunities to bring outside knowledge to the team. That is, individuals cannot simultaneously maximize these two parameters (intra-team centrality and extra-team structural holes), and the optimal balance between them is contingent upon the team condition (e.g., team
dispersion) under which cooperation must occur [12, 15, 30]. Network research suggests that individuals prefer to reinforce internal ties rather than to expand external network ties, when they perceive greater risks or challenges to collaboration. Increased team dispersion is regarded as introducing higher risk to internal cooperation [8, 11]. Studies on managerial decision making also suggest that individuals are more likely to seek the safety of internal collaboration in situations where cooperation is uncertain and risky [36] (p. 43). As previously discussed, geographical and temporal dispersions result in significant challenges for internal cooperation, thus causing individuals to prefer intra-team centrality over the external bridging associated with a large number of structural holes. Therefore, we derive the following hypothesis:

H4: One’s extra-team structural holes are less positively associated with task performance when the team members are more geographically (4a) and temporally (4b) dispersed than when they are less geographically and temporally dispersed.

4. Methods
4.1 Sampling and Data Collection

The DTs selected for this study were involved in information system (IS) development projects in a large global business consulting firm that adopted ESM as their communication platform in early 2012. Most of the teams surveyed had at least one member working in a different geographical space (e.g., a different city or country) or at different hours (e.g., different time zones or different shifts). We first contacted several executives of the firm and solicited their support by asking managers to encourage their team members to participate in our survey. Before the survey, the DT managers were asked to provide us with their team rosters, including e-mail addresses. After we received each DT’s roster, we sent a survey-request by to all DT members by email. We developed a dynamic website with auto-populated fields, and the email contained a link to the website so the respondents could easily access the survey.

We initially asked 200 people to fill out the questionnaire; 159 responses were collected. After removing 21 incompleted questionnaires, we used 138 responses for the final analysis.

4.2 Measures

Following Zhang and Venkatesh [48], we assessed the DT members’ task performance using the supervisor rating. We asked each DT manager to rate the members’ task performance. Use of ESM was assessed by adopting the concept of breadth and depth of IT use proposed by Massentti and Zmud [27]. We asked the respondents questions regarding the diversity of ESM functions that they had used and how heavily they relied on ESM for their work. The geographical dispersion of DTs was assessed by adopting the method by O’Leary and Cummings [32]. We asked respondents to name the city in which they worked. Based on information from the workplaces, we found all the possible links between the individuals and recorded them in a square social network matrix. We placed a “1” in the cell if the link between two people was “dispersed” (i.e., different cities) and a “0” if the link was “co-located” (i.e., the same city). Next, we used UCINet, social network analysis (SNA) software, to adopt the equation of network density. The index of network density represents the degree of connectedness among people within a particular team. In this case, a fully connected network suggested that every team member worked at a different location. As a result, a value of 1 indicated that all members worked at different locations (highly dispersed). We used the standardized descriptor of time zone difference to measure temporal dispersion [32].

To assess the individuals’ intra-team centrality, we employed an SNA method known as the roster method. First, we provided respondents with a fixed contact roster and asked them to describe their relationship with every individual on the roster [34]. Expressive and instrumental network ties were assessed separately by asking the respondents to indicate the intensity of their connection in terms of emotional closeness and work-related relations [18, 26]. To compute degree centrality, we used an index for in-degree centrality. In-degree centrality is a form of degree centrality that only counts relationships with a focal individual reported by other group members; thus, it does not suffer from self-reporting limitations as does out-degree centrality [5]. The respondents were then asked to list people with whom they had extra-team expressive and instrumental relationships. Following Ibarra [22], the respondents were not restricted to a fixed number of nominations; they were told that they could add as many names as they liked. After the respondents had listed the names, they were asked to describe their relationships with the contacts. The website for the survey provided the respondents with technical functions to support their responses. For example, as soon as a respondent entered his or her extra-group relations into the website, the next screen would automatically show the respondent all possible pairs of names.

To derive the numerical indices for the extra-team structural holes in each ego’s network, we used a network constraint index that describes the extent to
which a person’s network is concentrated on redundant contacts [6]. Network constraint refers to the extent to which a network is directly or indirectly concentrated on a single contact [6]. The constraint is high if contacts were either directly connected to one another or indirectly connected through a central contact. When the network constraint is lower, the number of structural holes within the network is higher.

5. Results

To address the multi-level nature of the research questions, we conducted our analysis using hierarchical linear modeling (HLM) version 6.02. The main advantage of HLM is that it permits the examination of relationships at different levels while maintaining the appropriate level of analysis [21].

5.1 Multi-level Modeling

The level 1 model predicts $Y_{ij}$, where $\beta_{0i}$ represents the mean level of a dependent variable at the individual level and $\gamma_{ij}$ represents the residual within-group variance. The level 2 model explains the impact of the team-level variables on the mean level of the dependent variable predicted at the individual level. The individual effects, represented by the micro-level coefficient $\beta$, are presumed to vary across teams. Therefore, a between-team or macro-level model can be formulated in which $\beta$ is conceived as the outcome variable that depends on a set of team-level variables.

5.1.1. Equations for Predicting Intra-team Centrality/Extra-team Structural Holes

**Level 1 (ex. for predicting intra-team centrality)**

$Y_{ij} (\text{Intra-team centrality}) = \beta_{0i} + \beta_{ij} (\text{use of ESM}) + \beta_{2i} (\text{Gender}*) + \beta_{3i} (\text{Age}*) + \beta_{4i} (\text{Organizational tenure}*) + r_{ij}$

*: control variables at the individual level

**Level 2**

$\beta_{0i} = \gamma_{00} + \gamma_{01i} (\text{Geographical dispersion}) + \gamma_{02i} (\text{Temporal dispersion}) + \gamma_{03i} (\text{Team size}) + \gamma_{04i} (\text{Team tenure}) + u_{0i}$

$\beta_{ij} = \gamma_{10i} + \gamma_{11i} (\text{Geographical dispersion}) + \gamma_{12i} (\text{Temporal dispersion}) + u_{ij}$

$\beta_{2i} = \gamma_{20i} + \gamma_{21i} (\text{Gender}*) + \gamma_{22i} (\text{Age}*) + \gamma_{23i} (\text{Organizational tenure}*) + u_{2i}$

$\beta_{3i} = \gamma_{30i} + \gamma_{31i} (\text{Geographical dispersion}) + \gamma_{32i} (\text{Temporal dispersion}) + u_{3i}$

$\beta_{4i} = \gamma_{40i} + \gamma_{41i} (\text{Gender}*) + \gamma_{42i} (\text{Age}*) + \gamma_{43i} (\text{Organizational tenure}*) + u_{4i}$

*: control variables at the team level

5.1.2. Equations for Predicting Task Performance

**Level 1**

$Y_{ij} (\text{Task performance}) = \beta_{0i} + \beta_{ij} (\text{Intra-team centrality}) + \beta_{2i} (\text{Extra-team structural holes}) + \beta_{3i} (\text{Gender}*) + \beta_{4i} (\text{Age}*) + \beta_{5i} (\text{Organizational tenure}*) + \gamma_{ij}$

**Level 2**

$\beta_{0i} = \gamma_{00i} + \gamma_{01i} (\text{Geographical dispersion}) + \gamma_{02i} (\text{Temporal dispersion}) + \gamma_{03i} (\text{Team size}) + \gamma_{04i} (\text{Team tenure}) + u_{0i}$

$\beta_{1i} = \gamma_{10i} + \gamma_{11i} (\text{Geographical dispersion}) + \gamma_{12i} (\text{Temporal dispersion}) + u_{1i}$

$\beta_{2i} = \gamma_{20i} + \gamma_{21i} (\text{Gender}*) + \gamma_{22i} (\text{Age}*) + \gamma_{23i} (\text{Organizational tenure}*) + u_{2i}$

$\beta_{3i} = \gamma_{30i} + \gamma_{31i} (\text{Geographical dispersion}) + \gamma_{32i} (\text{Temporal dispersion}) + u_{3i}$

$\beta_{4i} = \gamma_{40i} + \gamma_{41i} (\text{Gender}*) + \gamma_{42i} (\text{Age}*) + \gamma_{43i} (\text{Organizational tenure}*) + u_{4i}$

*: control variables at the team level

Table 1 shows the results of the HLM analysis for predicting one’s network properties within and across DTs; Table 2 shows the results of the HLM analysis for predicting task performance. The models were tested in both expressive networks and instrumental networks, respectively.

The results of the HLM analysis show a positive relationship between the use of ESM and intra-team centrality; this positive effect decreased when DT members were highly temporally dispersed ($\gamma_{12} = 0.12, p < 0.1$) (see Model 1 in Table 1). The moderation effect of temporal dispersion was insignificant in instrumental networks and significant only in the expressive networks, thus partially supporting H1b.

Model 3 in Table 1 shows that the use of ESM positively influences one’s extra-team structural holes and that this positive relationship between the use of ESM and extra-team structural holes is moderated by temporal dispersion only in expressive networks ($\gamma_{12} = 0.21, p < 0.05$), which indicates partial support of H2b. Model 1 in Table 2 shows that the positive effect of intra-team centrality on task performance is strengthened when DT members were highly geographically dispersed in expressive networks ($\gamma_{11} = 0.13, p < 0.01$), which indicate partial support of H3a.

Finally, Models 1 and 2 in Table 2 indicate that temporal dispersion negatively moderated the effect of extra-team structural holes on task performance in both the expressive networks ($\gamma_{12} = -0.24, p < 0.05$ in Model 1 of Table 3) and the instrumental networks ($\gamma_{12} = -0.27, p < 0.001$ in Model 2 of Table 3). Thus, H4b is fully supported.
6. Discussion

The purpose of this study was to examine the impact of the use of ESM on the structure of one’s social networks in the context of DTs with varying degrees of geographical and temporal dispersion. The results confirm the need for a multi-level examination to simultaneously capture individual dynamics and team context. Our main findings are as follows: (1) The use of ESM alters one’s network structures within and across DTs, and leads to better task performance; (2) the positive effects of the use of ESM on intra-team centrality and extra-team structural holes in expressive networks; (3) geographical dispersion has a negative impact on intra-team centrality and extra-team structural holes, while temporal dispersion has a positive impact on intra-team centrality; (4) team size and team tenure have a positive impact on task performance; (5) the interaction between use of ESM and geographical dispersion has a positive impact on task performance, while the interaction between use of ESM and temporal dispersion has a negative impact on task performance.
networks increase as the degree of temporal dispersion increase; (3) the positive effect of intra-team centrality on task performance increases as the degree of geographical dispersion increases; and (4) the positive effect of extra-team structural holes on task performance decreases as the degree of temporal dispersion increases.

Our findings are partially consistent with those of Suh et al. [39] in that the use of digital media changes one’s network structure. However, our work provides different insights into the impact of IT adoption on altering one’s network structure. While Suh et al. [39] argues that the use of communal media that enforces DT members’ participation in synchronous communication may hamper the development of an external network range when DT members are highly temporally dispersed, we found that the ESM use does not preclude extra-team structural holes even when DT members are highly temporally dispersed. We attribute this result to the distinct characteristics of ESM, which are different from those of conventional media. ESM is a converging digital platform that integrates diverse digital tools supporting (1) internal and external communication; (2) synchronous and asynchronous collaboration; (3) one-to-one, one-to-many, and many-to-many interactions; and (4) private and public knowledge sharing. People can utilize diverse IT functionalities provided by ESM to better achieve their goals. That is, the use of ESM helps employees overcome geographical and temporal separation, thereby developing social ties more easily than with conventional digital media.

One important finding from our work is that the positive network effects on task performance vary depending on the degrees of geographical and temporal dispersion. Our results show that the positive effect of intra-team centrality on task performance in expressive networks increases as geographical dispersion increases, which implies that people can benefit more from using ESM to develop expressive ties within a DT with a high degree of geographical dispersion than within a DT with a low degree of geographical dispersion.

Contrary to the positive moderating effects of geographical dispersion on the relationship between intra-team centrality and task performance in expressive networks, we found that the effects of extra-team structural holes were significantly reduced when DT members are highly temporally dispersed. This finding helps resolve the contradictory arguments appearing in the extant social network literature. We speculate that expanding external ties may create a negative association with task performance only when DT members are highly temporally dispersed. As previously discussed, individuals need more time and energy to ensure the safety of internal cooperation when members are highly temporally dispersed. Expanding external ties may interfere with internal cooperation partly because the introduction of external and diverse knowledge may upset a team’s consensus on the important decision making needed to move a project forward [18]. In this regard, when individual members are highly temporally dispersed and thus require intense internal cooperation, expanding external expressive ties is costly and may negatively influence task performance.

6.1 Implications

To our knowledge, this is the first empirical study to integrate the use of ESM and social network perspectives with the nuances related to how teams are dispersed. By examining dispersion from two different aspects (i.e., geographical and temporal) and of varying degrees, this study extends the current understanding of the influence of the use of ESM in the workplace. Our findings reveal that the network mechanisms do not operate equally in all situations but rather are contingent upon the degrees of geographical and temporal dispersion. Further examination of how individuals’ social networks produce more benefits with varying degrees of geographical and temporal dispersion would expand and sharpen the existing theories of social influence in DTs. The conceptualization and measures of team dispersion introduced in this study can enhance our understanding of the context of DTs and pave the way for integration with other DT issues.

Another contribution of our research is that it bridges a gap in IS literature by identifying two different types of social networks. Most studies on DTs that examined the network effect did not fully consider the different types of social networks. A DT is usually composed of individuals who have limited face-to-face contacts with other team members and mainly interact using electronic media. In addition, engaging in socialization activities outside working hours is difficult. The distinction between socio-emotional and instrumental communications is more salient in DTs than in traditional co-located teams [23, 33]. In this regard, the categorization of different types of social networks enhances the current understanding of the influence of social networks in DTs and offers valuable insight into the extant research on DTs.

Our results also have implications for practice. Drawing on the findings of this study, our recommendation for decision-makers exploring the application of ESM is that the constraints imposed on DTs (e.g., geographical and temporal dispersion) can effectively be overcome through the use of ESM.
However, a critical aspect of managing these relationships involves understanding when and where they are appropriate. We believe that optimal network configurations can be achieved by altering group compositions to include members with the most needed types of social ties and by changing current members’ behaviors and patterns of interaction through the use of ESM. This study offers the following suggestions for managing social networks in DTs.

DT managers should facilitate members’ socio-emotional interactions and instrumental communication using ESM to increase direct ties among DT members. Meanwhile, they should also facilitate using ESM so that DT members can expand their expressive and instrumental ties across work groups when group members geographically dispersed. However, managers and DT members need to pay attention to their network structure within and across teams and monitor whether their informal communication networks are optimally configured. IT designers can employ the technological function that automatically draws individuals’ network structures; internal centrality and external structural holes can be shown in the individuals’ personal pages in ESM, in which DT members configure or alter their network structures to maximize the benefits of virtual collaboration. On the contrary, when team members are highly temporally dispersed, managers should pay more attention to increasing team members’ direct expressive ties within a DT. However, managers should determine if members are expanding their ties outside the team when members are highly temporally dispersed.

6.2 Limitations and Further Research

Despite the intriguing findings of this study, the results should be interpreted cautiously because of the following limitations. First, the samples may have been biased because task characteristics were limited to only IS-related tasks. Future work should consider diverse task characteristics when explaining the impact of ESM and their different roles in achieving better task performance. Second, while we examined the impact of ESM in the workplace, we did not fully explain when and where specific functions of ESM could have more important effects on task performance. Future research would benefit from specifying the different technological affordances and linking them theoretically with different outcomes.

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8. References


